SCOR WG #162 for developing an
Observing Air-Sea Interactions Strategy (OASIS) for 2030
airseaobs.org

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A "system-as-a-whole" approach for making surface and boundary layer observations relevant to the Earth's energy, water, and carbon cycles, including their physical, biological, and geological components.
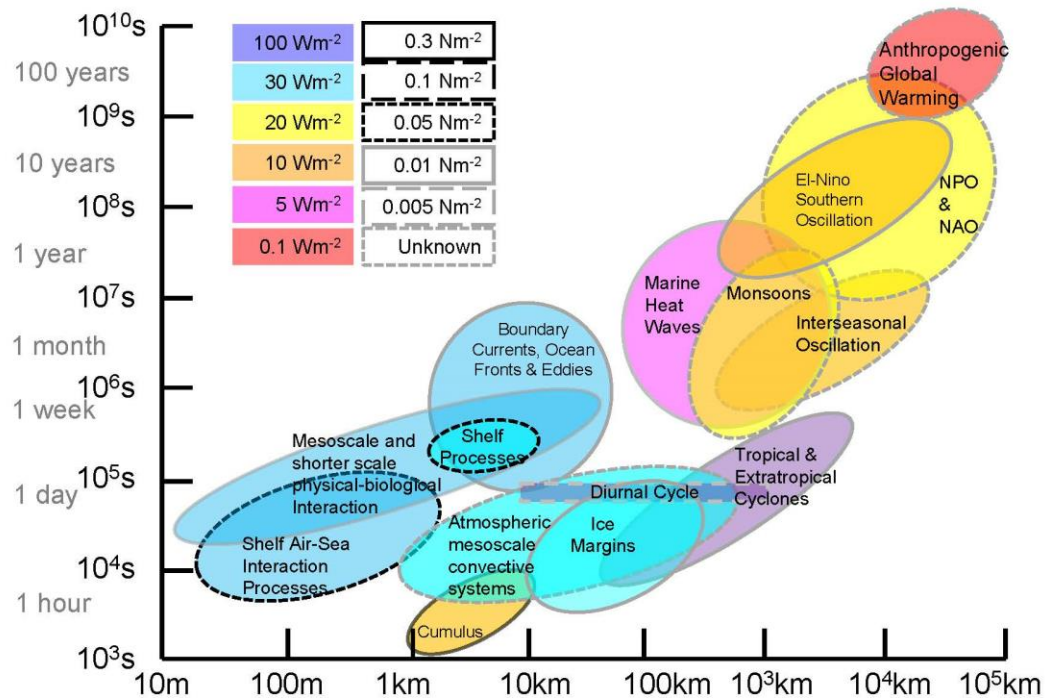
Integrating recommendations from

>36 OceanObs19 community strategy papers &

>400 authors

To predict weather and climate influenced by the ocean, we must accurately resolve air-sea heat fluxes

Cronin et al. (2019) "Air-sea fluxes with a focus on heat and momentum"

How accurate?
What resolution?
Where are these observations needed?
How can this be done?

An Observing Air-Sea Interactions Strategy (OASIS) for 2030

For global coverage of air-sea heat fluxes, we must:

Flux EOV/ECV	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Bulk SST	Partially met												Adequate
Skin Temperature	Partially met												Adequate
Wind Speed and Direction	Partially met												Adequate
Air Temperature	Not met												Adequate
Humidity	Not met												Adequate
Bulk Surface Currents	Partially met												Adequate
Skin Surface Currents	Not met												Adequate
Surface Solar Radiation	Partially met												Adequate
Surface Longwave Radiation	Partially met												Adequate
Albedo	Partially met												Met
Sea State	Requirement Unknown												Requirement Known

- 🟥 Requirement not met / inadequate
- 🟧 Requirement partially met / threshold
- 🟨 Requirement adequately met / breakthrough
- 🟩 Requirement fully met / ideal goal

(1) Optimize satellite-based boundary layer obs for near-surface air temperature & humidity, …

(2) Expand the global network of *in situ* air-sea interaction observations

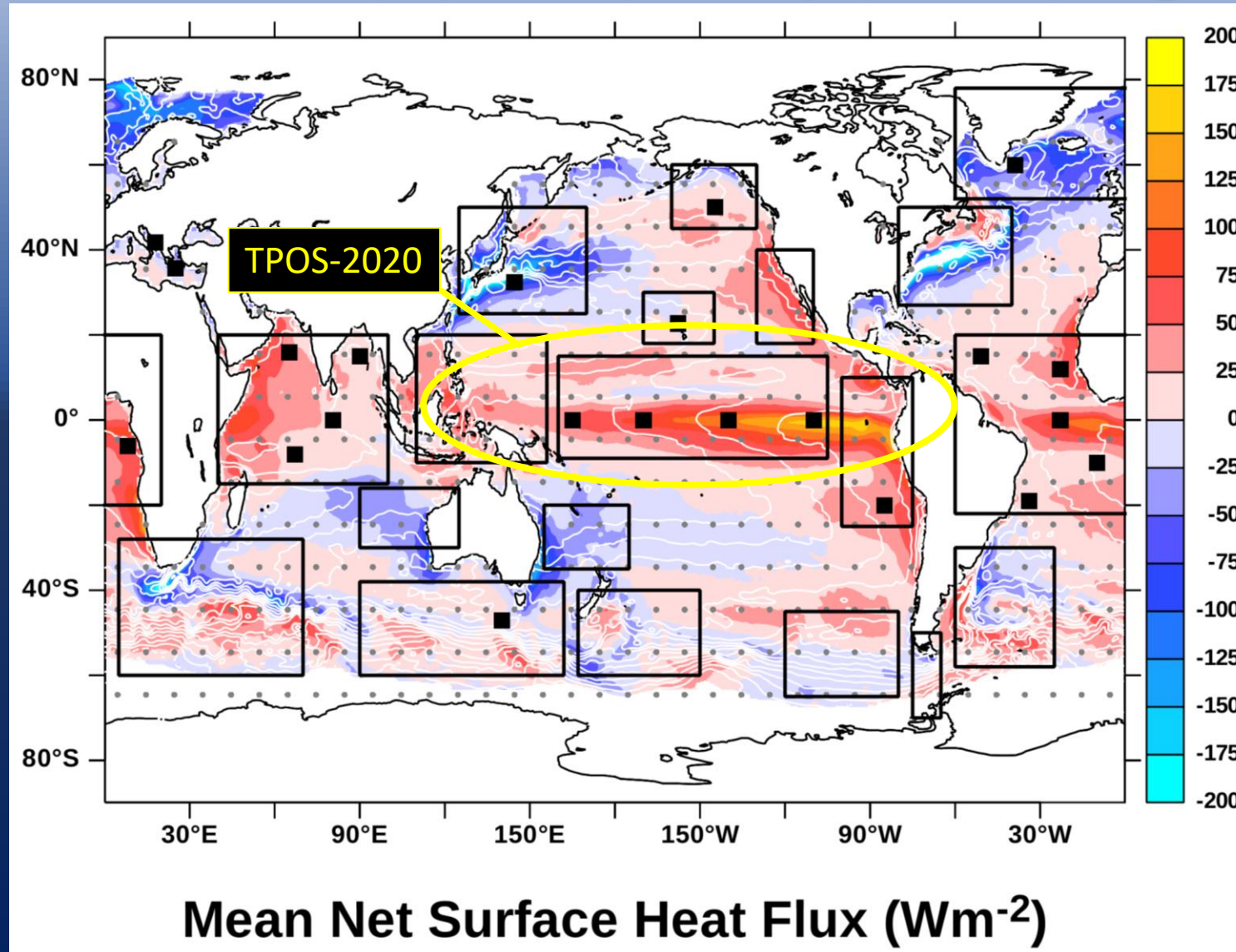Cronin et al. (2019) "Air-sea fluxes with a focus on heat and momentum"

Global network: 500-1000 drifting or mobile platforms and more reference stations (squares) in key (boxed) regions

Drifting and Mobile Flux Platforms (examples)

Reference Stations (examples)

TPOS-2020

Mean Net Surface Heat Flux (Wm^{-2})

Cronin et al. (2019) "Air-sea fluxes with a focus on heat and momentum"

Surface ocean CO_2 flux: all seawater pCO_2 measurements collected since 1957

SOCONET · SURFACE OCEAN CO2 OBSERVING NETWORK ·

Established Platforms:

Photo: UH

New Technology:

Photo: Saildrone

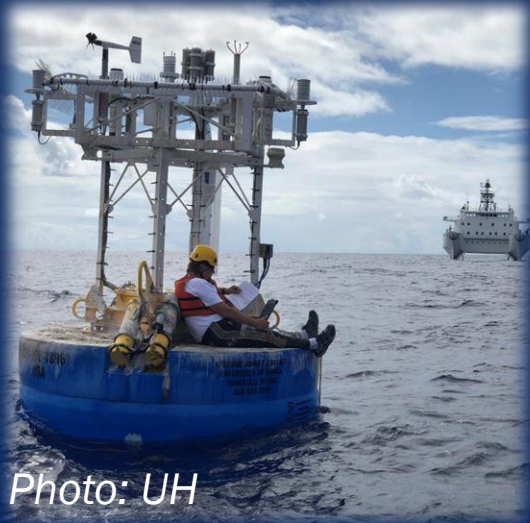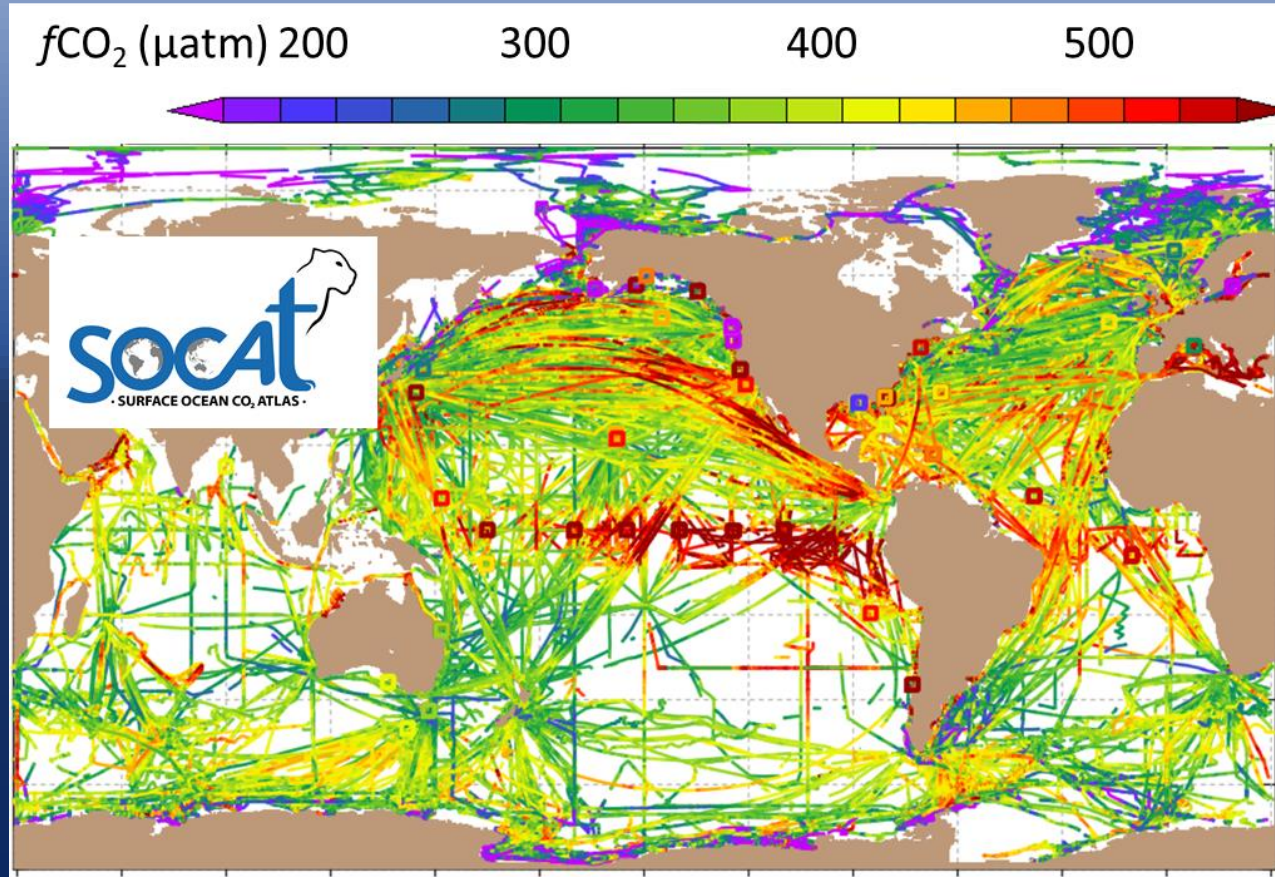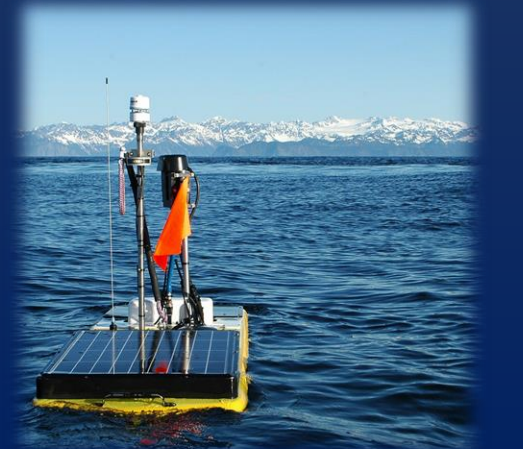fCO_2 (μatm) 200   300   400   500

SOCAT · SURFACE OCEAN CO2 ATLAS ·

Wanninkhof et al. (2019) "A Surface Ocean CO_2 Reference Network, SOCONET and Associated Marine Boundary Layer CO_2 Measurements"
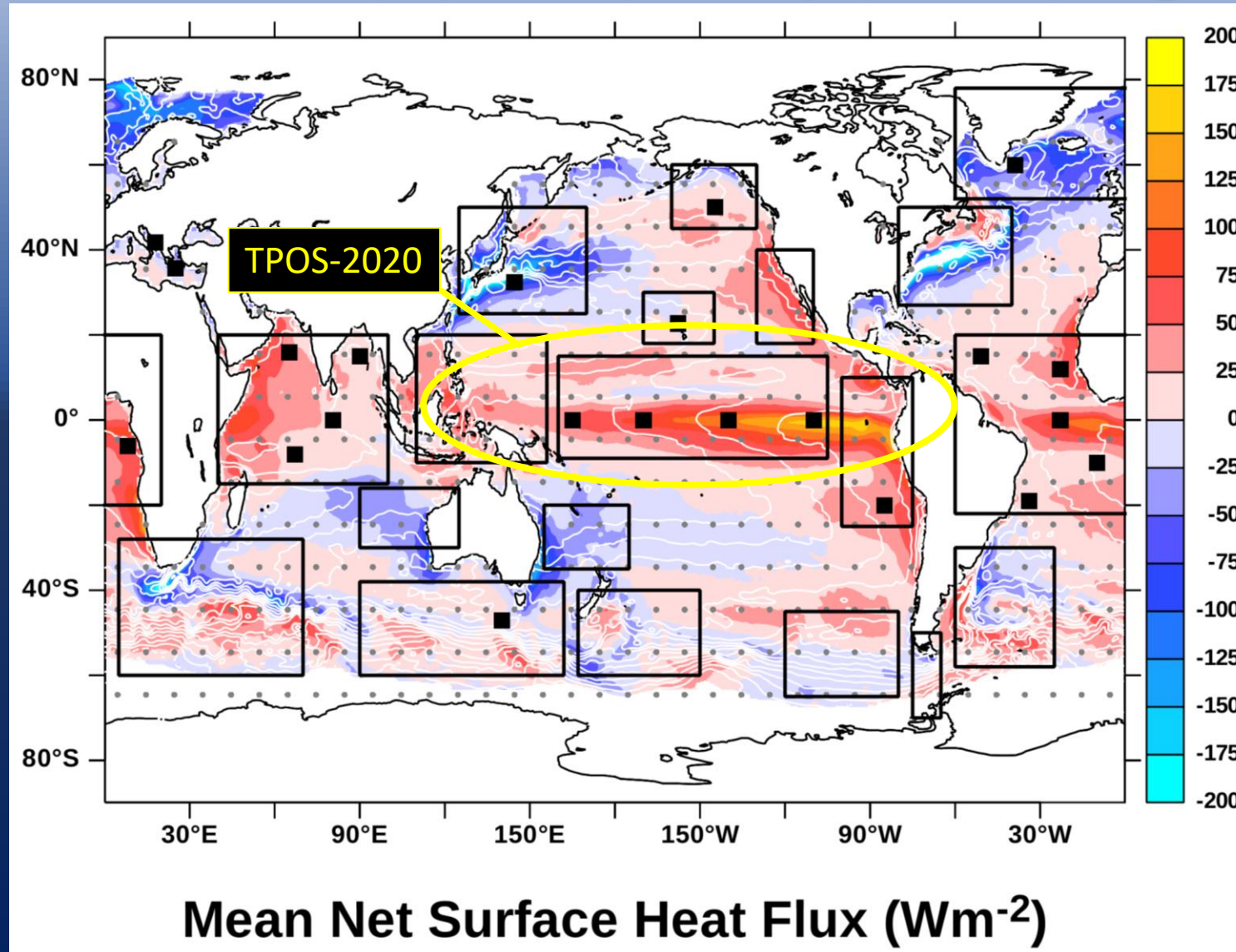
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